

NON-PUBLIC?: N
ACCESSION #: 8901250198
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Monticello Nuclear Generating Plant PAGE: 1 OF 4

DOCKET NUMBER: 05000263

TITLE: Reactor Scram Caused by Level Transmitter Calibration
EVENT DATE: 12/16/88 LER #: 88-007-00 REPORT DATE: 01/17/89

OPERATING MODE: POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION

LICENSEE CONTACT FOR THIS LER:
NAME: Michael F Hammer TELEPHONE: (612) 295-1317

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: JC COMPONENT: SHV MANUFACTURER: W165
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

A momentary false high level signal during calibration of a reactor protection system reactor level transmitter resulted in a feedwater pump and turbine trip that caused a reactor scram. Plant conditions were stabilized using normal scram recovery procedures. Cause of the event was degradation of the level transmitter pressurizing valve. The valve was replaced and additional guidance was provided to the instrument and control technicians to minimize the potential of recurrence in the event of a degraded valve.

END OF ABSTRACT

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Description of Event

During operation at 100% power on December 16, 1988 at approximately 0937, while performing a reactor protection system (JC) reactor level transmitter (LT) calibration required by Technical Specification 4.1, a momentary (approximately one second duration) hydraulic disturbance in the Division II safeguards level reference column occurred when the utility I&C technician

opened the pressurizing valve (SHV) for transmitter LT 2-3-58A. (See attached Figure). This disturbance resulted in a false high level signal from the Division II instruments that share this reference column, tripping the feedwater pumps (P) and the main turbine (TRB). The Division II instrument signals returned to normal immediately after the disturbance.

The reactor (RCT) scrammed as a result of the turbine trip. Group 2 and Group 3 primary containment isolations and startup of the Standby Gas Treatment system (BH) were initiated by the normal reactor level decrease following the scram. One feedwater pump was immediately restarted to restore reactor level and reactor pressure was controlled by the automatic operation of the A, B, E, G and H safety relief valves (RV). Plant conditions were stabilized by 0940 using normal scram recovery procedures.

All systems involved in the event were considered operable.

Cause of Event

Cause of the false high level signal was determined to be degradation of the pressurizing valve for transmitter LT 2-3-58A. The pressurizing valve is a small metering valve that is used to slowly pressurize the transmitter when returning it to service. Testing of the valve indicated that it opened more rapidly than an identical new valve. In addition, measurement of the valve needle stem revealed differences when compared with a new valve. The manufacturer determined that the degradation was due to wear, most likely accelerated by overtightening the valve when closing.

Analysis of Event

This event had no effect on public health and safety since all systems functioned as designed. The event could not have had more severe consequences regardless of initial conditions.

Corrective Actions

The pressurizing valve for LT 2-3-58A was replaced.

Additional guidance was provided for the instrument and control technicians specifying the proper pressurizing valve closing method to prevent overtightening and directing that particular attention be given to opening the valve slowly. These actions will minimize valve seat wear and reduce the probability of a process disturbance, even if the valve has degraded.

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A Technical Specification amendment is currently under review by the NRC Staff

to change the calibration frequency for these instruments from once-per-quarter to once-per-cycle. This will allow the calibration to be performed when the plant is shutdown.

Additional Information

Failed Component Identification : Whitey metering valve, catalog number SS-31RS4

Previous Similar Events

There have been no previous similar reportable events.

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FIGURE OMITTED - NOT KEYABLE (DRAWING)

Reactor Vessel Level Instrumentation

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EXHIBIT B

Northern States Power Company
MONTICELLO NUCLEAR GENERATING PLANT

COMPARISON OF THE DECEMBER 16, 1988 SCRAM
AND
A REACTOR WATER LEVEL INSTRUMENT LINE BREAK

Introduction

Following the December 16, 1988 scram, the NRC Staff requested a comparison be made between the events causing the scram and BWR Generic Issue 101. This generic issue concerns a reactor vessel level instrumentation line break and coincident redundant instrument failure which could disable ECCS injection in the event of a low level in the reactor vessel. The December 16, 1988 scram involved a momentary pressure transient in one division of the reactor vessel level instrumentation.

Background

Generic Issue 101, identified as "Break Plus Single Failure in BWR Water Level Instrumentation," is concerned with a break in one of the reference columns associated with the reactor water level measuring system and a coincident single failure in the redundant level column instrumentation. This

combination of events could cause a failure of automatic ECCS initiation should an actual low reactor water level occur.

This generic issue is being reviewed by the NRC Staff.

Generic Letter 84-23, "Reactor Vessel Water Level Instrumentation in BWRs," discussed this concern but no resolution was identified. The Boiling Water Reactor Owners Group prepared SLI-8211, "Review of BWR Reactor Vessel Water Level Measurement Systems," which is referenced in Generic Letter 84-23. Our response to this generic letter is dated December 5, 1984. Also referenced was NUREG-0737 Item II.F.2, "Inadequate Core Cooling Instrumentation." The generic letter and this NUREG-0737 item were closed on Monticello by the NRC Staff in a letter dated May 28, 1985.

Generic Issue 101

Generic Issue 101 concerns a break in one of two reference columns used for reactor vessel level instrumentation. The postulated break in the reference leg will cause a false high reactor water level to be sensed on all instruments on that column. The break will cause a low pressure on the reference leg side of the level differential pressure instruments. The variable leg will continue to sense reactor pressure. Therefore, the reactor water level instruments associated with this column will continually indicate high level. The effect of this false level signal at Monticello would be:

the turbine would receive a trip signal and
the reactor feedwater pumps would receive a trip signal.

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The high water level trip of the reactor feedwater pumps can be bypassed by a switch in the control room.

As a result of the turbine trip a reactor scram would be generated. HPCI and RCIC are tripped when a high water level signal is sensed by a two out of two logic. In this situation, only one of two trip signals would be generated since one signal is generated from each level column, thus HPCI and RCIC would not receive trip signals.

If an ECCS instrument on the unaffected level column would fail and provide a false high water level signal, HPCI and RCIC could be tripped on high water level (the high water level HPCI and RCIC trip comes from one of the two ECCS level instruments on each column). Also, no ECCS initiation would occur on an

actual low level in the reactor, since in this situation both of the low level signals on the unaffected column are required for initiation.

December 16, 1988 SCRAM

The December 16, 1988 scram occurred as a result of a momentary high level signal on one of the two level columns (See LER 88-07, Exhibit A). A pressure transient on the level column was generated as a result of instrumentation calibration and lasted for approximately one second as identified by the plant process computer. This momentary signal scrambled the reactor by tripping the turbine. Following the momentary pressure transient, all level signals from the affected column returned to normal and all safety systems were operable.

Comparison

The December 16, 1988 scram event involved a momentary false high reactor water level signal whereas the generic issue involves a continual false high reactor water level signal.

Had an instrument failure occurred on the unaffected level column causing another false high level signal during the December 16, 1988 scram, ECCS (and HPCI and RCIC) initiation would have been delayed during the one second pressure transient. HPCI and RCIC would have remained tripped by their high level trip feature until reset by the operator or until the reactor water level would have decreased to the initiation setpoint.

The December 16, 1988 scram and Generic Issue 101 both involve reactor scrams and false high reactor water levels signals, but the short time duration of the false signal during the December 16, 1988 scram make the potential consequences significantly different.

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NN

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January 17, 1989 Report Required by
10 CFR Part 50, Section 50.73

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50.263 License No. DPR-22

Licensee Event Report 88-007
Reactor Scram Caused By Level Transmitter Calibration

The Licensee Event Report for this occurrence is attached in Exhibit A.

This event was reported via the Emergency Notification System in accordance with 10 CFR Part 50, Section 50.72 on December 16, 1988.

The NRC staff has requested that we compare this event to Generic Issue 101. This comparison is enclosed as Exhibit B.

David Musolf
Manager - Nuclear Support Services

c: Regional Administrator-III, NRC
NRR Project Manager, NRC
Resident Inspector, NRC
MPCA
Attn: J W Ferman

Attachments: Exhibit A - Licensee Event Report 88-007
Exhibit B - Comparison of the December 16, 1988 Scram and
a Reactor Water Level Instrument Line Break

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EXHIBIT A
Northern States Power Company
MONTICELLO NUCLEAR GENERATING PLANT

License Event Report 88-07

*** END OF DOCUMENT ***
